CREATE BETTER LIVING WITH FENCING IN YOUR YARD

FENCES

Fences have one primary function: to improve your property. This improvement can take many forms, but for best results you must plan thoroughly and build well. Consider a fence as part of your investment in a home, as a handsome frame for your house. Design it to harmonize with your home's architecture. To do this intelligently, you must consider the physical characteristics of the land your fence will enclose. Is it steep? Flat? Does it slope gradually? Is it terraced? Each of these characteristics calls for a different fence plan. You should also consider your family's need or desire for protection or privacy. On the other hand, you may need a fence only for boundary definition. And it's good to know that with a properly designed fence it's even possible to exert a certain control over backyard climatic conditions.

As the name implies, a protection fence is one tall enough to keep small children from toddling into the street, and tight enough to keep wandering dogs out of your yard. Properly designed, such a fence can adapt itself to changing family requirements, starting out as a solid board fence and changed later to a more open type, such as a board and board. Privacy can be assured with a solid, tall fence that encloses completely, or with louvered panels strategically placed near the area of family activity. Boundary fences can be low and simple, or patterned in a design that compliments house and yard, since their main purposes are definition and interest.

You can mold your garden's climate by controlling sun and wind. Placement and design of fences control sunlight by casting shadows where desired louvers filter strong rays. Slotted, louvered or solid fences control and direct wind when properly designed and placed. Remember, when building a fence to control wind, that the direction of the prevailing wind is not necessarily the direction air currents will follow through, around and over your property. Your neighbor's fence, house or garage can create eddies, billows and streams of air in places and from directions never considered. Best way to check this is to place stakes at various spots where protection is desired, and from each stake suspend lightweight streamers of cloth or paper to show how the wind actually strikes your garden when it is, ostensibly, blowing from the direction of the prevailing wind.

You can build a fence of almost anything, but the best fence building material in the world is lumber. Lumber fences are adaptable; they're strong; they're long lasting; they can be built to fit your yard, your house style, your purse. There is literally no limit to the designs and types of fencing you can build with lumber. You can paint it . . . let it weather . . . or stain it. You can do the entire job yourself, and use only the simplest of tools. And, if you build with lumber from the Western Pine region, you'll find it easy to work with, straight and true, seasoned to assure tightness in fences built for privacy. It accepts and holds nails and paint wonderfully.

After deciding on the type of fence—protective or ornamental—look over the fence ideas in this booklet. Then visit your neighborhood lumber dealer. He's trained to help you select the right species, grades and sizes of lumber for the project, and will be glad to make helpful suggestions that can save you time and money.

THE LEGAL SIDE OF FENCE BUILDING

Know your local zoning laws on fences before you touch pencil or hammer. The three places to look for laws and regulations governing fence construction are: the laws of your state, if living outside a town; local ordinances if living in a city or town; and in the deeds and agreements signed at the time you bought your house and lot. One important point: don't assume that the fence you plan to build corresponds to local zoning laws just because it will be similar to a neighbor's, built a few years ago. Zoning changes may have been made in the meantime. Check with your local authorities before proceeding.

TYPES OF FENCE CONSTRUCTION

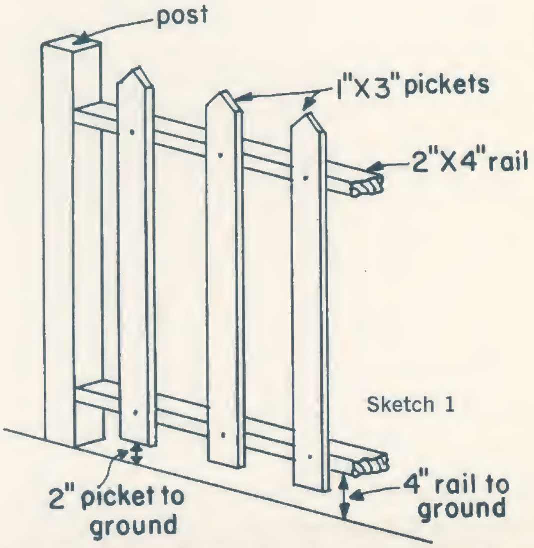
Although the variety of fences is almost limitless, certain basics hold true no matter how tall the fence, how long, how unique or commonplace. This booklet tells you what you need to know about materials, how to make the fence long-lasting and, of course, how to go about building just the type you want.

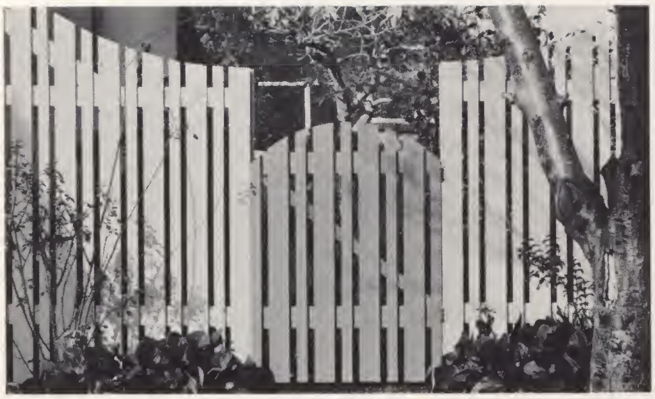
The eight basic types of lumber fences are picket, slat, lattice, board, board and board, basket weave, louver and rail. They have been conveniently classified in five groups for ease of illustration. All require posts; most require a top and bottom rail.

Examples of each type are shown on the following pages, with a diagram to illustrate distinguishing construction details of the type. Decide on the type of fence you want, and note the special construction details accompanying the illustration. Then read the directions on pages 6 and 7 for general instructions, utilizing the special construction features where necessary.

PICKET, SLAT & LATTICE FENCES

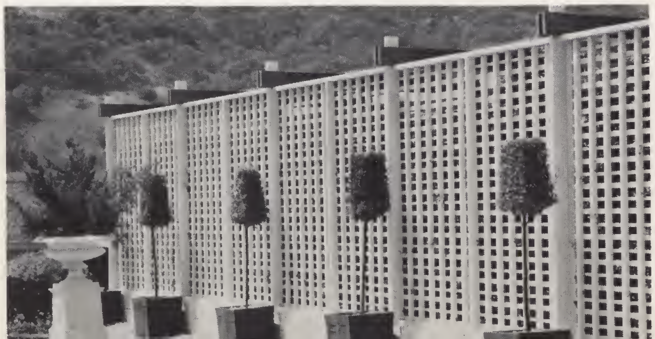
These three fences are similar in construction and easy to build. All require a standard post and rail frame, (see pages 6 and 7). Two of them use 4x4 or 6x6 posts, 2x4 rails. However, a lattice fence is usually a divider within a fenced area, or is used as a support in a garden and, consequently, requires only 2x4 or 2x6 posts. Picket fence tops are patterned or pointed and extend above the top rail. Slat fence tops are sawn square and usually placed level with top rail. Vertical members of all three fences are of 1″ stock, (see table on page 6 for sizes, grades, etc.). If an open lattice fence is desired, 2x4 or 2x6 material can be used to form an open grid on which flower pots can be arranged.





■ Patterned picket fence.

■ Lattice fence in a formal setting.



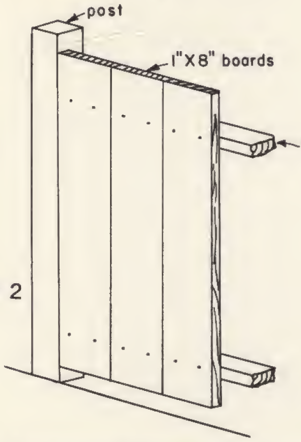
■ Slat fence has center rail for strength.

■ Open lattice fence uses dimension lumber.

Relief panels break monotony of board fence.

Board fence (left) combines effectively with board and board fence.

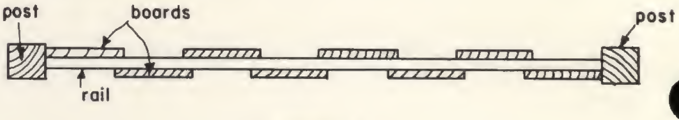
BOARD FENCE, BOARD & BOARD FENCE



Sketch 2

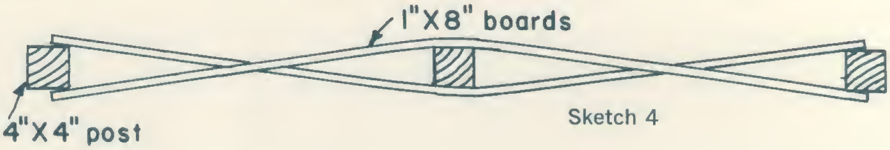
Both of these are essentially the same, except that the board fence is solid and the other is more open. Both use standard post and rail construction (pages 6 and 7) and 1″ boards of various widths for vertical members (see table on page 6 for sizes, grades, etc.). If you build a board fence, consider breaking up the expanse of wall with pattern or texture, such as alternate panels of horizontal and vertical boards. Solid foundations are a must for both fence types.

The board-and-board fence combines the privacy of the board fence with the openness of the picket fence; gives both privacy and ventilation. Construction is simple; boards are nailed to frame, leaving space between each board almost equal to board width. Another row of boards, similarly placed, but on opposite side of frame covers alternate spaces. See sketch 3.



Sketch 3

BASKET WEAVE FENCE



Sketch 4

A great favorite, the basket weave fence uses 1 inch or even ½-inch boards for the woven effect. One inch boards are used as vertical spacers. Follow basic construction procedure, pages 6 and 7, for setting posts. A bottom rail is not required; top rail is optional. Usually, the use of a top rail gives a framed effect to the weaving, produces a more disciplined appearance. Use 4x4 posts or 6x6 posts. Strips can be 4, 6 or 8 inches wide, although the usual width is 6 inches. Long strips—up to 16 feet—are best; and remember to separate the strips halfway between each post with a 1-inch spacer. Do not nail strips to spacer, nail only at posts. The woven appearance is more effective if alternate strips (rather than every strip) end on the same post. Paint pieces BEFORE assembly.

Woven fence with top rail gives disciplined effect.

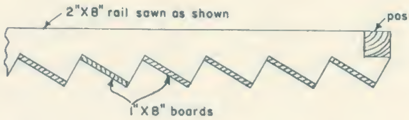
Woven fence without top rail.

Louver fence combines privacy with ventilation.

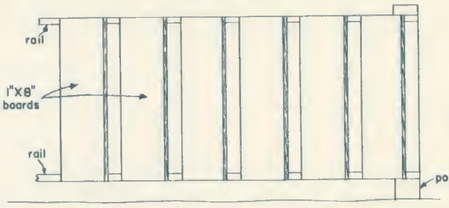
LOUVER FENCE

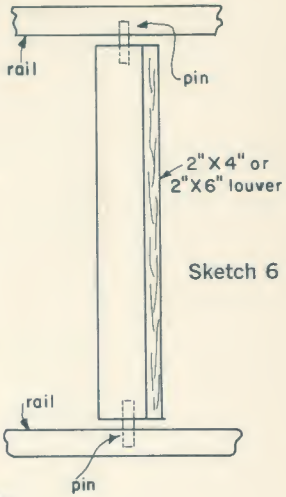
Here's a fence that's both functional and handsome. In its most elaborate form, the louvers are movable to take advantage of, or shield from, the sun's rays. In others, the louvers are fixed at a 45° angle, determined best for privacy. See pages 6 and 7 for frame details. Top and bottom rails are usually made of 2x6 or 2x8 material. Movable louvers are made of 2x4 or 2x6 stock. If louvers are fixed to top and bottom rails, saw the rails as shown on sketch 5 and nail boards on angled cuts for fully enclosed or open effect. See sketch 6 for details of pivot louvers.

Sketch 5



Sketch 7

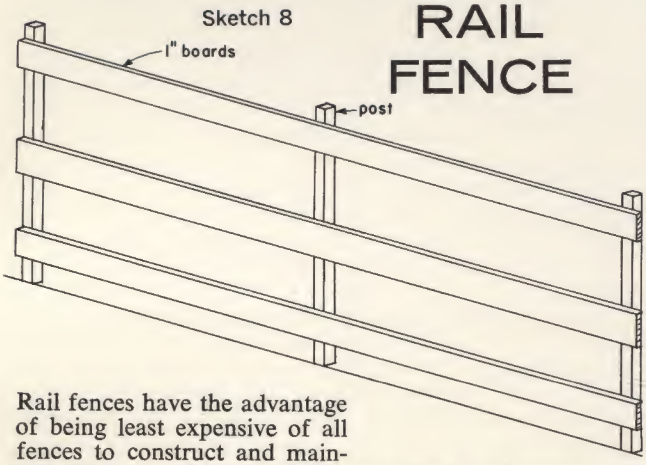




Sketch 6

RAIL FENCE

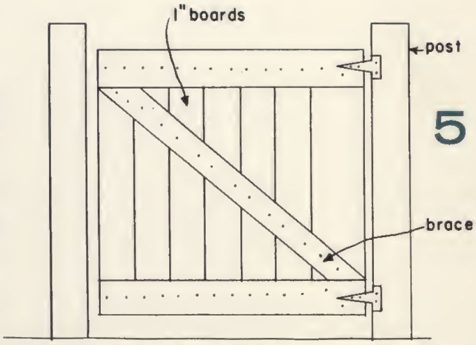
Sketch 8



Rail fences have the advantage of being least expensive of all fences to construct and maintain. No top or bottom rails are required, and posts can be of 4x4 or 6x6 material. In the simplest dressed lumber version, the rail fence requires only 1x4 or 1x6 boards at top, center and bottom, see sketch 8. More elaborate rail fences are made of dimension lumber, (2x4, 2x6), with mortised joints at each fence post, see sketch 18, page 7.

Rail fence utilizes herringbone pattern.

GATES



The secret of an attractive gate is good construction. Use rugged hinges—three per gate if gate is over 5 feet tall—and strong latches. Then set gate posts so they can't twist or be pulled out of plumb, see directions on page 7. Build gate as shown on sketch 9, and brace with lumber strip. Be sure to place lumber brace in exact position shown (that is, with top of brace on upper corner *away* from hinges and bottom of the lower corner of the gate *toward* the hinges). If this is not done, gate will not have maximum strength against sagging. If desired, 2x4 frame can consist of four pieces to which siding is nailed, although this is desirable more from an appearance standpoint than from strength.

Outside dimensions of gate should be 1½" less than space between gateposts. When gate is hung, there should be about ¾" clearance on both sides of gate . . . the hinge side and the latch side. Also, the bottom of the gate should clear any obstruction on the walk by ¾". Block gate in place and, using large, strong hinges, attach hinges to post with long screws—i.e., 3" screws in 4" posts. Use galvanized or cadmium plated hardware throughout to avoid rust streaks.

Patterned gate can be strong, yet simple.

HOW TO BUILD THE BASIC FRAME

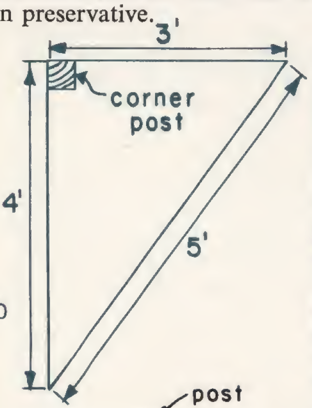
MATERIALS: Your best fence building material is, of course, lumber. And any of the Western Pine region species makes a good choice. These species are Ponderosa Pine, Idaho White Pine, Sugar Pine and Lodgepole Pine, Douglas Fir, Larch, White Fir, Engelmann Spruce, Incense Cedar and Red Cedar. Properly treated with a good commercial preservative, all can be expected to give a lifetime of service. (The Cedars have a unique natural durability and will give years of service under normal conditions without a preservative treatment). Tables below show common sizes and grades of lumber used in fence construction. Use "Standard" grade for all posts and rails.

FENCE TYPE	FENCE HEIGHT (Feet)	LINE POST SIZE (Inches)	CORNER POST SIZE (Inches)	MINIMUM POST LENGTH*	POST DEPTH *	POST INTERVAL (Feet)	TOP RAIL SIZE (Inches)	BOTTOM RAIL SIZE (Inches)	BOARDS	
									SIZE (Inches)	GRADE
PICKET	3-5	4x4	6x6	4'3"-7'	1'3"-2'	8	2x4	2x4	1x2, 1x3, 1x4	D-Select or Com.
BOARD	to 4	4x4	6x6	5'8"	1'8"	8-10	2x4	2x4	1x6, 1x8	#2 Common—use S/L** or T&G*** for best fit.
	4-6	6x6	8x8	5'8"-8'5"	1'8"-2'5"	8-10	2x4	2x4	1x6, 1x8	
	6-8	8x8	8x8	8'5"-11'3"	2'5"-3'3"	8-10	2x4	2x4	1x6, 1x8, 1x10	
BOARD & BOARD	SAME AS FOR BOARD FENCE (ABOVE) EXCEPT NOT NECESSARY TO USE S/L OR T&G									
LOUVER (ROTATING)	4	4x4	6x6	5'8"	1'8"	8-10	2x6	2x6	2x4	Standard
	4-6	6x6	8x8	5'8"-8'5"	1'8"-2'5"	8-10	2x8	2x8	2x6	
	6-8	8x8	8x8	8'5"-11'3"	2'5"-3'3"	8-10	2x8	2x8	2x6	
LOUVER (FIXED)	4	4x4	6x6	5'8"	1'8"	8-10	2x6	2x8	1x8, 1x10	#2 Common
	4-6	6x6	8x8	5'8"-8'5"	1'8"-2'5"	8-10	2x8	2x8	1x8, 1x10	
	6-8	8x8	8x8	8'5"-11'3"	2'5"-3'3"	8-10	2x8	2x8	1x8, 1x10	
BASKET WEAVE	4	4x4	6x6	5'8"	1'8"	10	2x4	None	1x4	#2 or #3 Common
	4-6	6x6	8x8	5'8"-8'5"	1'8"-2'5"	10	2x6	None	1x6, 1x8	
	6-8	8x8	8x8	8'5"-11'3"	2'5"-3'3"	10	2x6	None	1x6, 1x8	
SLAT	4	4x4	6x6	5'8"	1'8"	8	2x4	2x4	1x1, 1x2	D-Select or #2 Common
	4-6	4x4	6x6	5'8"-8'5"	1'8"-2'5"	8	2x4	2x4	1x1, 1x2	
	6-8	6x6	6x6	8'5"-11'3"	2'5"-3'3"	8	2x4	2x4	1x1, 1x2, 1x3	
LATTICE	4	2x4	4x4	5'8"	1'8"	8	2x4	2x4	1x1 or 1x2 for light fences, or 2x4 or 2x6 for heavier fences	D-Select
	4-6	4x4	4x4	5'8"-8'5"	1'8"-2'5"	8-10	2x4	2x4		
	6-8	4x4	6x6	8'5"-11'3"	2'5"-3'3"	8-10	2x4	2x4		
RAIL light	4	4x4	6x6	5'8"	1'8"	8-10	None	None	1x4, 1x6	#2 Common
RAIL heavy	4	6x6	6x8	5'8"	1'8"	8-10	None	None	2x4, 2x6	Utility
GATE	to 5	4x4					2x4	2x4	to match type of fence	Standard
	over 5	6x6					2x4	2x4		

*for sizes in excess of those shown, allow 40% of post height for underground portion. **Shiplap ***Tongue & Groove

NAILS: Always use aluminum alloy nails or galvanized steel nails for all fence work. Their resistance to oxidation will mean a tighter, stronger fence, unmarred by rust stains. When nailing dimension stock, use 16d common nails; for nailing 1-inch boards to 1-inch boards, use 8d nails. When nailing 1-inch stock to 2-inch stock also use 8d nails.

PRESERVATIVES: To assure long life, all fence posts and bottom rails should be treated with a protective solution. The three preservatives best suited to home fence construction are: Pentacholorophenol, copper napthenate and zinc napthenate. Your lumber dealer usually carries lumber already treated with one of these preservatives. If you wish to do the treating yourself, your lumber dealer usually carries a line of preservatives and can give you directions on their use. Remember that dipping or soaking the lumber is far more effective than just brushing on preservative.

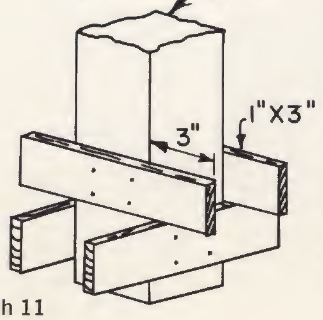


Sketch 10

ALIGNMENT: If you build a boundary fence, be sure you're on the right line. This precaution can save you expense and trouble of relocating your fence, should it be found later to have encroached on your neighbor's property.

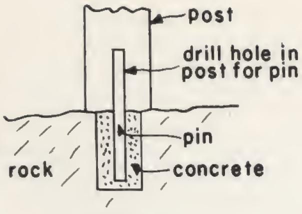
Having established the corners of your fence, prepare enough stakes to mark the site of each post in the proposed fence. You'll also need a ball of twine, hatchet, chalk, carpenter's square and a long steel tape.

Stake each corner with a solidly driven stake. Then string twine tightly between stakes and tie securely. Locate sites for posts between corners by measuring along the twine with the steel tape. See table 1 for intervals. Drive a stake at each of these points. To assure a true right angle, use the 3-4-5 method, (see sketch 10): measure off 3 feet on one string and mark this point with chalk. On the other string, measure off 4 feet from the centerline of the same stake. Mark this point with colored chalk also. Measure the diagonal distance from one chalk mark to the other. It should be 5 feet if strings are at right angles to each other. If distance is less or more, shift strings to attain 5 foot distance.



Sketch 11

POST HOLES: You will encounter one of—or a mixture of—three basic soil types when you dig post holes: sandy soil, clay soil or rock. In sandy soil, where drainage is good and post is to be placed directly into soil without cement collar, dig holes only 2" greater in diameter than posts. For greater rigidity and strength, however, posts should be set in concrete, or cleats should be used near end of post. Cleats, or scabs, are made of four pieces of 1x3 or 2x4 preservative-treated wood, each piece 6 inches longer than the width of post used. For example, a 4x4 post requires a 10" scab. Scabs are spiked to underground portion of post, see sketch 11, to act as underground bracing.



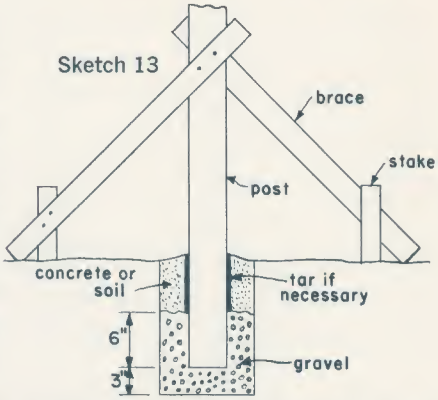
Sketch 12

In clay or heavy soils, make holes for 4″ posts at least 12″ in diameter. The empty area around the 4″ post is then filled with gravel to facilitate good drainage. Dig a hole of the same diameter for posts to be set in concrete or posts using cleats.

See chart (page 6) for correct depth of holes, and how to figure proper depth for post holes in fence sizes not listed in table.

If you encounter a large rock while digging post holes, drill the rock with a star or power masonry drill, wedge with mason's wedges and split with sledge. To fasten a post to rock, should you encounter bed rock or a rock too large to be removed, see sketch 12 for details of fastening post by means of steel pin. Be sure hole drilled in post for pin is exactly centered and runs true for its entire length. Pour concrete around pin in rock and do not disturb for at least 48 hours. Dig all holes, using one or a combination of these methods.

Sketch 13



SETTING POSTS: Post must be plumb, precisely aligned and firmly set to secure a good-looking, straight fence. You'll need a tamping bar, hammer, 16d nails, carpenter's level and twine.

Start at a corner—usually a gate corner—and fix corner post firmly in place as follows: shovel 3″ of gravel into post hole and tamp firmly. Place post on top of gravel. Then shovel in 6″ of gravel, so that post rests on a gravel base and has a gravel collar extending 6″ from the bottom, see sketch 13. Tamp gravel firmly in place around post so that post will stand upright. Be sure post is plumb by checking with carpenter's level against two sides. Brace post, as in sketch 13, to keep post plumb. Fill hole with gravel or soil or concrete. If gravel or soil is used, tamp firmly. If concrete is used, and if a rail is to be mortised into the post, fit it before pouring concrete. A good concrete mix can be made from 1 part cement, 3 parts clean sand and 5 part gravel.

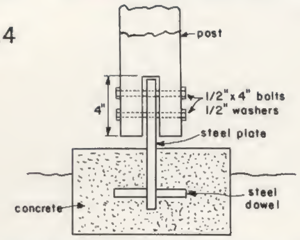
Pour concrete on top of gravel already in place. If you live where freezing is severe, here's a tip to keep the concrete from cracking: set the post as detailed above, in gravel. Then, before pouring the concrete, wrap the post in corrugated cardboard, SMOOTH SIDE OUT. Pour concrete. After concrete has cured, remove corrugated cardboard and pour melted roofing tar into crack between concrete and post. This forms an expansion collar to take up the stresses of expansion and contraction during freezing.

Another very good way to assure long life for your fence is to pour a concrete block below ground level and embed a steel plate with two bolt holes in the plate into the concrete. At least 5″ of the length of plate should extend above the concrete, see sketch 14. Slot the fence post, slip it over the plate and bolt firmly to the steel plate. Whichever method you use, you now have one corner post in place, firmly set and plumb.

Place another cornerpost in the next corner hole securely . . . but not permanently. Reason for this is that if cumulative error mounts over long line of posts, last corner post can be aligned with preceding post for better visual effect than if permanently set, in which case lateral difference might be very noticeable. Tightly stretch twine between permanently set corner post and opposite temporarily set post. Use string as guide in setting intermediate posts. Always use a gravel base and collar in each post hole to assure good drainage and consequent long life for posts. Tamp firmly and proceed as in setting first post. When intermediate posts are set, make necessary adjustment to far corner post to procure perfect alignment. Set cornerpost permanently. Work to next corner, and continue process until area is enclosed or gate post is reached.

After concrete is poured around any post, remember that no further work can be done on fence until after concrete has cured . . . usually, this requires 48 hours.

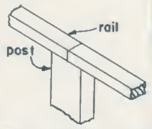
Sketch 14



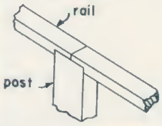
GATE POSTS: Because of the great strain they must withstand, gate posts should be set deeper and should be larger than other posts. For example, if fence posts are 4x4, gate posts should be 6x6. If fence posts are set 2 feet in ground, gate posts should be set an additional foot. If fence posts are set in ground only, with no concrete collar, gate posts should have cleats or scabs nailed to them to prevent shifting, see sketch 11. Scabs should extend 3″ beyond each side of post to firmly anchor gate post against strain of swinging gate.

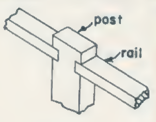
FASTENING RAILS: Rails are the horizontal pieces that connect the posts. Apply a heavy preservative treatment to all surfaces of contact between rails and posts, rails and boards. Usually made of 2x4 stock, rails are attached to posts by one of four joints: butt joint, lap joint, dadoed joint or mortised joint. Details of each are shown in sketches 15 through 18. Use the butt or lap joint only in picket fences, slat and lattice fences, and relatively low board or board-and-board fences. In tall fences of solid construction, use lap and butt joints only for top rails.
The dadoed joint is much stronger, and can be used for all types of fences, including the louvered. In its simplest form it consists of a groove cut into the posts and on which the rail rests. The mortise joint is strong, but difficult to make. If you use it, fit joint between mortise and tenon tightly. Waterproof or marine glue can be used in the joint for a long-lasting job.

15-Butt

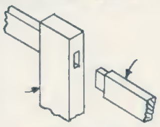


17-Dado





16-Lap



18-Mortise

ATTACHING VERTICAL MEMBERS: You now have the framework completed. It will be applicable to most of the eight fences mentioned previously. Refer to the section under the type of fence you plan, and determine details of attaching vertical pieces—the pickets, board, louvers or slats. Where even spacing is an appearance factor, as in picket or board fences, use a piece of wood as a gauge between vertical members. Set the first one vertically, use a straight gauge to space and plumb, and the entire fence will be a neat, professional-looking job.

FINISHING: Fences may be painted, stained or left to weather to a pearl gray. If the fence is to be painted, it should first be primed with a primer coat, then two coats of a good quality paint applied. If you have wood with pitchy knots, it is suggested you coat the knots with a commercial knot sealer based on formula WP-578. To seal knots and prime in one operation, use preparation WP-578-P, a combination sealer-primer. Your lumber dealer handles both products or can obtain information about them. After applying either of the two preparations, follow with two coats of good paint. For further information on exterior painting, consult your local lumber dealer.

You will find the Western Pine Region wood species among the finest "working" woods you've ever used. They are ideal for the home craftsman. They are even-textured and easy to saw, shape, drill and sand. All species take and hold stain or paint evenly. Specify Western Pine Region species for a job well done.

Digitized by: The Association for Preservation Technology
From the collection of: Floyd Mansberger, Fever River Research
www.IllinoisArchaeology.com

WESTERN PINE ASSOCIATION
IDAHO WHITE PINE ■ PONDEROSA PINE ■ LODGEPOLE PINE ■ SUGAR PINE ■ LARCH
WHITE FIR ■ DOUGLAS FIR ■ ENGELMANN SPRUCE ■ RED CEDAR ■ INCENSE CEDAR
QUALITY GRADED LUMBER ■ YEON BUILDING ■ PORTLAND 4, OREGON

Form 507